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# Social Capital Formation Enhancing Inclusive Growth: A Development Mechanics for Backward Region

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November 24, 2012

## Abstract

Recently, economics literature incorporates the role of social capital as an explanation for why some regions/countries are rich and others remain poor. Economic development of country/region depends on the impact of social capital which includes social culture, social norms and regulations that promote economic reforms and development activities. Social capital is defined in a broad term containing the social networks and norms that generate shared understandings, trust and reciprocity, which underpin cooperation and collective action for mutual benefits and creates the base for economic prosperity. Social capital acts as a driver of economic growth. Social capital forms with the development of human capital through schooling. Educated individuals are interested in dialogue and conversation. People interact in a purposeful manner with each other in families, workplaces, neighbourhoods, associations (local, national or international) and range of informal and formal meeting places. Interaction enables people to build trust, confidence and cooperation, to commit themselves to each other (i.e. *reciprocity*), and thereby to knit the social fabric. This paper tries to develop mechanism through which social capital forms and that contributes to economic development in the framework of endogenous growth model. This study deals with the formation of social capital through development of human capital that is created through improvement of *schooling* and/or *social inclusion*. Social capital actually greases the wheels that allow nations or regions to advance smoothly.

**JEL Classifications:** Z<sub>130</sub>, J<sub>240</sub>, O<sub>150</sub>.

**Key Words:** Social Capital, Social network, Co-operation, Trust, Reciprocity, Human Capital, Economic Growth, Schooling, Social Inclusion, Economic Development, Endogenous Growth.

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# **Social Capital Formation Ensuring Inclusive Growth: A Development Mechanics for Backward Region**

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## **1. Introduction**

The study of determining factors of economic growth in the literature mainly focuses on the factors like the relative stock of physical and/or human capital, trade, the available technology and capability to produce and diffuse knowledge etc. Earlier studies omit a relevant dimension: social culture that promotes economic growth and development. Economic analysis has given less emphasis to the social culture, social norms and regulations that promote economic reforms and development. Economic development of country/region depends on the wider impact of social culture. Recently, economists become more and more interested in the role of social culture as an explanation for why some regions/countries are rich and others remain poor though they have (nearly same levels of) physical and human capital. Several studies have investigated the impact of social culture, which includes social structure based on trust, norms, cooperation and networks. All these lead to develop a new concept of social capital<sup>1</sup> (Bourdieu 1980,

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<sup>1</sup> Bourdieu (1986), Coleman (1988) and Putnam et al. (1993) are credited for introducing the concept of social capital. Coleman (1990) defines social capital: ‘...social organization constitutes social capital, facilitating the achievement of goals that could not be achieved in its absence or could be achieved only at a higher cost.’ Putnam et al (1993) provide similar characterization, ‘...social capital.. refers to features of social organization, such as trust, norms, and networks that can improve the efficiency of society..’. According to them, social capital is a type of positive group externality that arises from social organization (Coleman 1990), specifically informal forms of social organization such as trust, norms and networks (Putnam et al (1993)). Fukuyama (1997) argues that only certain shared norms and values should be

1986; Coleman 1988, 1990; Putnam et al. 1993; Putnam 2000; Fukuyama 1997; Lin 2001; Ostrom 2000; Cohen and Prusak 2001; Rose 2000; Bertrand and Mullainathan 2000; Beugelsdijk and Smulders 2004; Glaeser et al. 2000; Knack et al. 1997; Tau 2003; etc.). Social capital is a broad term containing the social norms and networks that generate shared understandings, trust and reciprocity, which underpin co-operation and collective action for mutual benefits, and creates the base for economic prosperity. The concept of social capital has a long history in the social sciences. In the last two decades of the twentieth century Bourdieu<sup>2</sup> (1980, 1986), Coleman<sup>3</sup> (1988, 1990) and Putnam<sup>4</sup> (1993, 1995) popularized it.

Bourdieu (1986) introduced social capital to explain how social and economic forces create and maintain capitalist culture. According to Bourdieu (1986) economic, cultural and social capitals together shape the permissible actions in any particular field of operation. Cultural capital knows how to achieve one's goals and social capital knows people who could help one to do so. Bourdieu (1986) saw these three as running together

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regarded as social capital. '...Social capital can be defined simply as the existence of a certain set of informal rules or norms shared among members of a group that permits cooperation among them. ... The norms that produce social capital.. must substantively include .. the meeting of obligations, and reciprocity.'

<sup>2</sup> Bourdieu (1986) defines the social capital as 'the sum of the resources, actual or virtual, that accrue to an individual or group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition'.

<sup>3</sup> Coleman (1988) defines social capital by its function. 'It is not a single entity, but a variety of different entities, with two elements in common: they all consist in some aspect of social structures, and they facilitate certain actions of actors within the structure' (Coleman 1988).

<sup>4</sup> Social capital is referred to as 'features of social life-networks, norms, and trust that enable participants to act together more efficiently to pursue shared objectives' (Putnam 1993). Putnam (2000) introduces the idea of social capital in terms of relations or interdependence between individuals: '...social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them.'

in class formations, and also as convertible<sup>5</sup>. Coleman (1988) develops an alternative view of social capital emphasizing on the collective aspects of social capital<sup>6</sup>. He argued that social capital is defined by its function. This functionalist view of social capital is multi-faced. Coleman outlines three aspects of social capital: obligations and expectations, information flow capability, and norms accompanied by sanctions. Social capital, in Putnam's view, is the "features of social organization such as networks, norms, and trust that facilitate coordination and cooperation for mutual benefit". Putnam was careful that his view of social capital should not be seen as a substitute for economic capital. Social capital refers to the norms and networks that enable collective action.

These three foundational views of social capital have significant areas of overlap with some important incompatibilities. Bourdieu's conception of social capital is clearly a tool of oppression. Putnam's view seems to regard association between people as positive in its own right. Coleman's perspective emphasizes the use of social capital as a precursor of human capital. Bourdieu and Coleman agree that the notion of social capital can be converted into other forms of capital. Thus, social capital appears to be a desirable object for policy-making. Policy can aim to increase social capital with the related ideas of *school improvement* and *social inclusion*. This is our main concern.

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<sup>5</sup> Take for example, the upper classes convert economic capital into cultural and social capital by sending their children to private schools. Social and cultural capitals gain their value because people with status recognize the value of each other's capital, so even though individuals (or households) utilize these capitals and they have collective effects.

<sup>6</sup> Social capital is the shared knowledge, understanding, norms, rules and expectations about patterns of interactions that groups of individuals bring to a recurrent activity (Ostrom 2000). 'Social capital may be defined operationally as resources embedded in social networks and accessed and used by actors for actions' (Lin 2001). So, the concept of social capital has two important components: (i) it represents resources embedded in social relations rather than individuals, and (ii) access and use of such resources reside with actors. So, social capital can be considered as the stock of active connections among individuals - the trust, mutual understanding, and shared values and behaviours that bind the members of human networks and communities and make possible cooperative action (Cohen and Prusak 2001).

Social capital<sup>7</sup> also greases the wheels that allow communities or nations to advance smoothly. Social capital contributes to economic growth by focusing the importance of cooperation and trust within firm, industry, market and the state. Heller 1996, Ostrom 2000 and Rose 2000 point out that social capital contributes to economic growth<sup>8</sup> by facilitating collaboration between individual interests towards the achievement of increased output. Several studies (Bertrand and Mullainathan (2000), Beugelsdijk and Smulders (2004), Bjornskov (2006), Glaeser et al. (2000), Alesina and Ferrara (2002), Miguel (2003), Knack et al. (1997), Sobel (2002), Tau (2003), Temple and Johnson (1998)) have discussed about the features of social capital and its contribution to economic growth. Few studies have given attention how this social capital generates or what policies stimulate to form this capital<sup>9</sup>. The mechanism through which social capital is created, accumulated (or influences on the economic activity) is still opened. This study focuses on these untouched parts of the determinants of social capital in the growth model. This paper mainly concentrates on how social capital forms through development

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<sup>7</sup> It represents one of the points of interaction between individual and society, since social capital allows the individual to act in certain ways, but only within a collectively defined and supported area of freedom. Interaction enables people to commit themselves to each other and to knit the social fabric. A sense of belonging and the concrete experience of social networks bring benefits to the members. Individuals are engaged in repeated interactions with others and everyday business, so, social transactions are less costly. An individual has access to resources through social capital that depends on his/her connections, the strength of these connections, and resources available to it. Truly, social capital helps to improve the efficiency of society by facilitating coordinated action. Thus, social capital creates a common platform in which individuals can use membership and networks to secure benefits. Social capital allows individuals to resolve collective problems more easily. Individuals often might be better off if they cooperate, with everybody doing her/his own work. In this context, social norms and the networks that enforce them provide an institutional mechanism with the power to ensure compliance with the collectively desirable behaviour.

<sup>8</sup> Countries/regions with relatively higher stocks of social capital, in terms of generalized trust and widespread civic engagement seem to achieve higher levels of growth, compared to societies with low trust and low civicness.

<sup>9</sup> At the final stage of this draft I find a paper of Rupasingha et al (2006) explain the generation of social capital. Our approach is different from them.

of human capital in the channel of productive consumption<sup>10</sup>. Development economists (Steger 2002, Dasgupta and Marjit 2002) recognize the possibility of productive consumption that enables the satisfaction of current needs and also increases productivity of labour. The productive consumption stimulates to accumulate human capital through which the base is created for cooperation, social norms, regulations and institutional formations, and thus, it helps to develop and strengthen social networks and thereby form the social capital. We analyze the formation of social capital and its impact on economic development in the framework of endogenous growth model.

This study is organized as follows: Section 2 builds up a model in the framework of endogenous growth model. Following Steger (2002), Section 2.1 discusses how productive consumption develops human capital. Section 2.2 analyses how the developed human capital (or educated individuals) generate and accumulate social capital. Section 2.3 provides standard welfare function and optimizes it with respect to constraint. Section 2.4 analyses the results derived from our model. Section 2.5 deals with welfare function incorporating social capital. Section 3 supports our model empirically. Section 4 discusses about the possible policies that help to develop social capital and lastly concludes.

## **2. Model**

The representative household produces output,  $y$ , using composite capital,  $k$ . Under AK-type production technology, the intensive production<sup>11</sup> functional form is

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<sup>10</sup> The expenditure on health and education has positive contribution to the output growth, which is revealed, on macroeconomic level (Hicks 1979, Wheeler 1980). This consumption expenditure (activities) is classified as productive consumption.

<sup>11</sup> All variables are measured in terms of per capita. Here, we assume that population growth rate is zero.

$$y = f(k), f' = \text{const} \tan t, f'' = 0 \text{ and } f(0)=0. \quad (1)$$

The assumption of diminishing returns is replaced by constant returns, which is crucial for sustainable growth and also a broader interpretation of capital. Steger (2002) defines capital as the composition of physical and human capital, here we add the social capital to it for wider sense of capital that is discussed later.

One part of produced output is used for consumption and other part for investment. The equation of motion of the physical capital,  $k_p$ , is

$$\dot{k}_p = f(k) - c - \delta_p k_p \quad (2)$$

Where  $\delta_p$  is the depreciation rate of physical capital.

## 2.1 Productive Consumption creates human capital

One portion of consumption is used for the development of human capital in terms of health and education that increases the productivity of labour. This type of consumption is considered as productive consumption that helps to develop human capital (Steger 2002). The productive consumption improves human capital of a country/region and thereby economic development. Human capital enhancement function,  $h(c)$ , is strictly concave (such that,  $h'(c) > 0$ ,  $h''(c) < 0$  and  $\lim_{c \rightarrow \infty} h(c) = \bar{h}(c)$  or  $\lim_{c \rightarrow \infty} h'(c) = 0$  and  $\lim_{c \rightarrow \infty} h''(c) = 0$ ). The equation of motion of the human capital,  $k_h$ , is

$$\dot{k}_h = h(c) \quad (3)$$



Physical capital<sup>12</sup>,  $k_p$ , is produced on the basis of the same technology that is used to produce consumption goods and its accumulation requires, at least in part, the renunciation of consumption, while human capital,  $k_h$ , results from productive consumption (Steger 2002).

## **2.2 Human Capital develops Social Capital**

Development of human capital creates the base for the formation of social capital. We highlight the case of schooling through which social capital (social norms, trust, cooperation, networks etc) forms. Education's longstanding concern with association and the quality of life in associations make direct and indirect important contribution to the development of social networks<sup>13</sup> (trust, tolerance and reciprocity that are usually involved). Educated individuals are interested in dialogue and conversation, and develop cultural environment in which people can work together (cooperative and trustworthy). So, education or school improvement creates the platform for interaction between individuals<sup>14</sup>. Interaction enables people to commit themselves to each other, and thereby to knit the social fabric. This is the basis for the formation of social capital.

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<sup>12</sup> In this context,  $k_p$  could be equally interpreted as physical and human capital that requires the renunciation of consumption for its accumulation (Steger 2002).

<sup>13</sup> Educational achievement is likely to rise significantly, and the quality of day-to-day interaction is likely to be enhanced by a much greater emphasis on the cultivation of extra-curricula activity involving groups and teams. Thus, encouraging the development of associational life can also make a significant difference to the experience of being in different communities.

<sup>14</sup> In other word, human capital is capable to create and develop norms, regulations, and social networks that form the social capital, and thereby economic growth and development (Temple and Johnson (1998)).

There is considerable evidence<sup>15</sup> that communities with a good stock of social capital are more likely to benefit from higher educational achievement, better health, and better economic performance. Social capital of an economy definitely depends on the available stock of human capital. So, social capital formation should be a function of human capital, i.e.,  $S = \phi(k_h)$ , with usual property  $\phi' > 0$  and  $\phi'' < 0$ . The equation of motion of the social capital,  $k_s$ , is

$$\dot{k}_s = \phi(k_h) - \delta_s k_s \quad (4)$$

Where  $\delta_s$  is the depreciation rate of social capital.

The whole stock of composite capital is defined as  $k = k_p^\alpha k_h^\beta k_s^{1-\alpha-\beta}$ . The equation of the motion of stock of composite capital,  $k$ , can be written as:

$$\dot{k} = \eta_1 \dot{k}_p + \eta_2 \dot{k}_h + \eta_3 \dot{k}_s \quad (5)$$

Where  $\eta_1 = \frac{\alpha k}{k_p}$ ,  $\eta_2 = \frac{\beta k}{k_h}$ ,  $\eta_3 = \frac{(1-\alpha-\beta)k}{k_s}$ .

Substituting eq.(2) - (4) in eq(5), it can be written as

$$\dot{k} = \eta_1 f(k) + \eta_3 \phi(k_h) - \psi(c) - \{ \eta_1 \delta_p K_p + \eta_3 \delta_s K_s \} \quad (6)$$

Where  $\psi(c) = \eta_1 c - \eta_2 h(c)$  is the Net Consumption.

The equation (6) contains two additional terms viz., social capital  $\phi(k_h)$  and net consumption  $\psi(c)$ , which includes productive consumption  $h(c)$ . It should be noted that productive consumption creates human capital, which has two fold impact on the economy – directly develops human capital and indirectly creates social capital.

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<sup>15</sup> Social capital is highly correlated with good educational outcomes, good health and good government

### 2.3 Welfare function

Individuals may form or join groups – whether they are organized around certain (enthusiasms) interests, social activity, economic and/or political aims – can make considerable contribution to the economy. The simple act of joining regularly involved in organized groups has a significant impact on individual well being.

The representative household maximizes her (his) instantaneous utility through consumption at each moment. The traditional objective of the household is

$$\underset{u(c)}{Max} \int_0^{\infty} U(c) e^{-\rho t} dt \quad (7)$$

Subject to the constraint  $\dot{k} = \eta_1 f(k) + \eta_3 \phi(k_h) - \psi(c) - \{\eta_1 \delta_p K_p + \eta_3 \delta_s K_s\}$

$k_p(0) > 1$ ,  $k_h(0) \geq 1$  and  $k_s(0) \geq 1$ .

### 2.4 Implications

F.O.C of this solution is

$$u_c = \lambda \psi_c \quad (8)$$

where  $\lambda$  is the shadow price of  $k$  and  $\psi_c = \eta_1 - \eta_2 h_c$ . The eq. (8) implies that along the optimal trajectory the marginal utility of consumption equals to marginal net cost of consumption in utility measured units. It is also clear that the level of consumption is higher compare to productive consumption.

The optimal economic growth rate is

$$\frac{\dot{c}}{c} = (\sigma + \theta)^{-1} \left\{ \eta_1 f_k(k) + \frac{\eta_3}{\eta_2} \phi_{K_h} - (\rho + \delta_p + \delta_s) \right\} \quad (9)$$

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(Putnam (2000)).

Where  $\sigma = \frac{-cu_{cc}}{u_c} > 0$ ,  $\theta = \frac{c\psi_{cc}}{\psi_c} = \frac{-\eta_2 h_{cc} c}{\eta_1 - \eta_2 h_c}$ , provided  $\eta_1 \neq \eta_2 h_c$ , i.e.,  $\theta$  is undefined

at  $h_c = \frac{\eta_1}{\eta_2} = \frac{\alpha}{\beta} \frac{k_h}{k_p}$ ,  $\theta < 0$  if  $h_c > \frac{\alpha}{\beta} \frac{k_h}{k_p}$  and  $\theta > 0$  if  $h_c < \frac{\alpha}{\beta} \frac{k_h}{k_p}$ .

The term  $\sigma$  is inter-temporal elasticity of consumption. The second term,  $\theta$  is the elasticity of net consumption, in the first bracketed term. It is the only extra term added to traditional optimal consumption growth rate due to productive consumption. That means the consumption or expenditure on health and education improves human capital, which stimulates to grow further. In other words, productive consumption has significant effect on economic growth through the elasticity of net consumption ( $\theta$ ).

We observe that social capital is an important factor that explains economic growth. Since  $\phi_{K_h} > 0$  economic growth rate is more in eq.(9) than the productive consumption growth model developed by Steger (2002). This difference is created due to incorporation of social capital that is reflected in the second term,  $\phi_{K_h}$ , in the second bracket in eq. (9). The marginal productivity of social capital,  $\phi_{K_h}$ , is positive and thereby it has definite returns or/and incentives to grow the social capital through widening social network.

**Proposition 1:** *Marginal productivity of social capital,  $\phi_{K_h}$ , fastens economic growth rate as long as definite returns from it.*

The optimal growth path of the economy (eq.(9)) differs from our conventional growth path due to the term  $\phi_{K_h}$ . Now we rewrite the second term in second bracket of eq (9) as

$$\frac{\eta_3}{\eta_2} \phi_{K_h} = \frac{1 - \alpha - \beta}{\beta} \frac{K_h}{K_s} \frac{\partial S}{\partial K_h}. \text{ It should be noted that } \frac{K_h}{K_s} \frac{\partial S}{\partial K_h} \text{ is the (cross) elasticity or}$$

sensitivity of  $K_s$  with reference to  $K_h$ . If the social capital formation is insensitive to

human capital ( $\phi_{K_h} \rightarrow 0$ ) the economic growth rate (eq (9)) tends to represent the conventional growth rate (Solow growth model). The economic growth rate will be more compared to the conventional growth rate because of the contribution of social capital in the economy (i.e.,  $\phi_{K_h} > 0$ ). Thus, as long as social capital has definite contribution or return the economic growth rate will be higher with proper (or balance) economic development.

For the analytical purpose, we specify the following functional forms.

Production function:  $y = f(k) = Gk$  (10)

Human capital enhancement function:  $h(c) = \ln(1 + c)$  (11)

Social capital function:  $\phi(k_h) = \begin{cases} \frac{\underline{S}k_h}{\underline{S} + k_h} & \text{when } \begin{cases} k_h \geq \underline{k}_h \\ k_h < \underline{k}_h \end{cases} \\ \underline{S} & \end{cases}$  (12)

Utility function:  $u(c) = \frac{c^{1-\sigma} - 1}{1 - \sigma}$  (13)

Suppose, the economy is at  $k_h < \underline{k}_h$ , then  $\phi(k_h) = \underline{S}$ , social capital is only in terms of family bonding. The economic growth rate is

$$\frac{\dot{c}}{c} = [\sigma + \theta]^{-1} \{ \eta_1 G - (\rho + \delta_p + \delta_s) \} \quad (14)$$

This is a low level of equilibrium growth rate with fixed level of social capital.

Suppose the economy is at  $k_h \geq \underline{k}_h$ , then  $\phi(k_h) = \frac{\underline{S}k_h}{\underline{S} + k_h}$ , social contacts or networks

increases and strengthening the social bonding or linking/bridging capital and thereby employability rises as well as economic growth. Then the economic growth rate is

$$\frac{\dot{c}}{c} = [\sigma + \theta]^{-1} \left\{ \eta_1 G + \frac{\eta_3}{\eta_2} \frac{\underline{S}^2}{(\underline{S} + k_h)^2} - (\rho + \delta_p + \delta_s) \right\} \quad (15)$$

This is a high level equilibrium growth rate with higher social capital formation compared to eq. (14). Obviously, economic growth rate at  $k_h \geq \underline{k}_h$  is higher than at  $k_h < \underline{k}_h$  only because of the presence of effective social capital (second term) in second

bracket viz.,  $\frac{\eta_3}{\eta_2} \frac{\underline{S}^2}{(\underline{S} + k_h)^2} > 0$ .

Now graphically we explain and analyze the economic growth and development at different stages of economic position. The formations of human and social capital are explained graphically in the R-side  $(c, k_h)$  plane and L-side  $(k_h, k_s)$  plane in figure 1, respectively. Figure 1 shows the possible multiple equilibrium situations. A low-level equilibrium trap exists in less developed economy, which has poor quality human capital in terms of health and education, and social network confines only with family relationship. Therefore, social network/capital remains more or less fixed at  $k_s^*$ . It is independent of  $k_h$  up to a minimum level of human capital  $\underline{k}_h$  that does not help to generate sufficient social network in terms of bridging/linking capital<sup>16</sup>, which could be productive. In such low level or underdeveloped economy, low level of human capital is insensitive and ineffective and fails to play a significant role to develop productive social capital. Therefore, less developed economy remains at  $e_1 (k_h^*, k_s^*)$  low level equilibrium trap that occurs at low level of social, human and physical capital (Fig .1).

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<sup>16</sup> It is a productive social capital that is accumulated as a result of simultaneous production and consumption of relational goods taking place in the context of different kinds of social participation, which facilitate the learning of cooperative attitudes, behaviours and reciprocity (Sabatini 2006).

The productive consumption is a crucial development policy for improving human capital that helps to generate social capital and thereby economic development. Social capital formation (in terms of bridging capital) takes shape as soon as human capital exceeds  $\underline{k}_h$  as defined in Figure 1 and continues until it reaches its maximum. This situation leads to a stable equilibrium at  $e_3 (k_h^{***}, k_s^{***})$  high level of capital ( $k^{***}$ ) and corresponding high consumption level ( $c^{***}$ ). In between low and high level equilibrium, an unstable equilibrium exists at  $e_2 (k_h^{**}, k_s^{**})$  corresponds to  $c^{**}$ . From fig.1, we observe multiple equilibrium ( $e_1, e_2$  and  $e_3$ ) with two stable equilibrium at ( $e_1$ ) and ( $e_3$ ), and one unstable equilibrium ( $e_2$ ) in between them. If once the economy crosses  $k_h^{**}$ , in fig.1, it certainly leads to higher economic growth rate along with higher level of human and social capital. It should be noted that  $\underline{k}_h - k_h^{**}$  is very difficult zone for less developed countries (LDC) and comparatively high effort (or big push) is required to achieve considerable social development and economic growth.

Low-level equilibrium trap exists when  $k_h < \underline{k}_h$  and the productive consumption is ineffective to develop human capital as well as social networks. It becomes effective and efficient only when  $k_h \geq \underline{k}_h$ . Thus, effectively productive consumption affects economic growth only after attainment of  $\underline{k}_h$  level of human capital that starts to generate social network and thereby social capital.

Economy needs greater efforts for development of human capital particularly for the zone of  $\underline{k}_h - k_h^{**}$  (i.e.,  $\underline{k}_h < k_h < k_h^{**}$ ). As soon as  $k_h$  exceeds  $k_h^{**}$ ,  $k_s$  monotonically increases with  $k_h$  that develops from productive consumption. In the context of economic

development, productive consumption is effective only in  $c^{**} - c^{***}$  zone corresponding to  $k_h^{**} - k_h^{***}$  and  $k_s^{**} - k_s^{***}$  zones. It should be noted that an unstable equilibrium exists at  $e_2(k_h^{**}, k_s^{**})$ . A stable equilibrium occurs at  $e_3(k_h^{***}, k_s^{***})$  with high social capital. It should be mentioned that developments of infrastructure and communication systems, which are highly depends on the availability of physical and human capital, highly affect the formation of social network/capital. So, in this context, we have to consider that social capital formation depends on both human and physical capital, i.e.,  $S = \phi(k_p, k_h)$ . For simplicity we consider here that only human capital generates social capital, i.e.,  $S = \phi(k_h)$ , and continue our analysis.

## 2.5 Social capital/network improves social welfare

Social capital also operates through psychological and biological processes to improve individual's lives. Mounting evidence suggests that people whose lives are rich in social capital cope better with traumas and fight illness more effectively. So, social capital makes an enormous difference to our lives. This can be captured in better way in the utility or welfare functional form. Individual welfare depends on consumption,  $c$ , and social capital,  $k_s$ , i.e.,  $u(c, k_s)$ . So, the representative individual  $\underset{u(c)}{Max} \int_0^{\infty} U(c, k_s) e^{-\rho t} dt$  subject to constraint (eq.(6)).

The optimal growth is

$$\frac{\dot{c}}{c} = (\sigma + \theta)^{-1} \left\{ \eta_1 f_k + \frac{\eta_3}{\eta_2} \phi_{k_h} - (\rho + \delta_p + \delta_s) + \frac{\psi_c}{\eta_3} \frac{u_{k_s}}{u_c} + \nu \frac{\dot{k}_s}{k_s} \right\} \quad (16)$$



Where  $\nu = \frac{k_s u_{ck_s}}{u_c} > 0$ , as  $u_{ck_s} > 0$ .

**Proposition 2:** *Social capital influence welfare through psychological process and thereby economic growth rate rises.*

### 3 Empirical Observations

In this section we try to provide some empirical support for the above said model based on cross-country study. First we try to show that the income level increases with rising social capital which increases with the improvement of human capital. Here we consider the trust in people (see Inglehart et al. (2004) for details), average years of schooling 1990, and life expectancy 1990, as the social capital, human capital (education) and quality of life (or health condition), respectively.

#### 3.1 Data and Empirical results

In this study we have borrowed (used) the data set that is available in the website: <http://www.nek.uu.se/staffpages/publ/p431.xls>. This (excel) data file collect and compile several data from different sources (given in details in p431 excel file). Several studies (Zak and Knack (2001), Bengtsson et al. (2005), Berggren and Jordahl (2006)) have used these data. We have taken few relevant variables - viz., growth per capita (annual percentage growth rate of real GDP (chain) per capita 1990-2000), trust<sup>17</sup> (first value of trust 1990-2000, World Value Surveys), per capita real GDP (Penn World Table 6.1), schoolmean90 (average years of schooling 1990, Barro and Lee 2000), pol-right90 (political rights 1990, Freedom House), civil-lib90 (civil liberties 1990, Freedom House),

school\_loggdp90 (product of average years of schooling and log of GDP per capita in 1990), lifeexp1990 (life expectancy 1990) and socinf (index of social infrastructure) for this study. As a measure of democracy, we use the reverse order of civil liberty and political rights as given in the said excel file. In this study political rights and civil liberty increase with the index 1 to 7. No political rights (civil liberty) and full political rights (civil liberty) indicate “1” and “7”, respectively. There are 58 countries out of 63 have no missing or unobservable values in excel file. We concentrate on those 58 countries only for our empirical analysis (Table A1). Table A2 and A3 in appendix provide the summary statistics of the variables and association (correlation) among themselves, respectively.

Human capital forms through schooling. This schooling (education) creates and strengthens the political rights and civil liberty that jointly interact and build social infrastructure and develop social capital. Figure 2a also indicates positive relationship between average schooling and social infrastructure. Figure 2b shows a direct association between average schooling and social trust. This indicates that as literacy rate increases the social infrastructure (network) and the trust in people improves. Thus, both figures 2a and 2b indicate that the development of human capital improve the social capital. Table 1 provides the impacts of schooling on different socio-economic variables unconditionally (without other covariates). These empirical findings suggest that the average schooling have direct impact/influence on civil liberty, political right, income, social trust and infrastructure. The health condition (life expectancy at birth) also improves with education (schooling) at a decreasing rate. The improvement of health condition is

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<sup>17</sup> First value of trust in people (%) 1990 – 2000 from World Value Surveys plus Newzealand from a government sponsored survey [www.worldbank.org/research/growth/pdf/files/trust\\_data.xls](http://www.worldbank.org/research/growth/pdf/files/trust_data.xls) for 1980, 1990-

strongly and directly associated with the creation of social infrastructure. Thus, all these indicate that the development of human capital is crucial to create the social capital.

**Insert table 1 here**

Next we search for the contribution of social capital on economic growth of a country. Figure 3a and 3b show the direct relationship between social infrastructure and per capita GDP, and social trust and per capita GDP, respectively. Table 2 presents the empirical results of the impact of social capital on the income level. Social infrastructure and trust have direct influence on the country's income level. Civil rights and human capital (education or schooling, health condition) has also positive impact on the income level.

**Insert table 2 here**

Figure 4 suggests that the economic growth rate increase with the improvement of social capital (specifically social trust in people). Table 3 presents the empirical results of the impact of social capital on the economic growth rate. Social trust has a definite and positive impact on the economic growth rate. However the impact of infrastructure on economic growth rate is not clear to us.

**Insert table 3 here**

Our empirical findings suggest that the social trust in people, civil rights, social infrastructure and quality of life improve as human capital develops through schooling. These social capitals have definite impact on the income level as well as on the economic growth and development. Thus, these empirical results support our model.

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91, 1995-96 (see Zak and Knack 2001).

#### 4 Policy

In the less developed economies or societies, the productive consumption should be a crucial policy for development of human (health and knowledge) capital that generates social norms, regulations and cooperation, and builds up social networks that helps to create and concretize social capital. So, the productive consumption is effective and essential in LDC for accelerating economic growth. As productive consumption ( $c$ ) increases the human capital  $h(c)$  rises and influences the economic growth rate through elasticity of productive consumption ( $\theta$ ). Thus, productive consumption should be a good policy for the development of underdeveloped countries if it truly enhance the human capital of that country.

The policy makers should focus those forms of social capital, which will noticeably improve the economic prosperity of distressed communities, and the economic inclusion of deprived, disadvantaged and marginalised individuals. Social capital can be created in a wide variety community based projects like business support (entrepreneur) development programme, sports development programmes or community networks, work for food programmes etc. Community development programs should be the prime policy to develop face-to-face interaction among individuals and creates a setting of norms for the development of trust among themselves (Dowla 2006, Sabatini 2006). This established new norms build a new level of social trust that acts as collateral and solve the collective action problems of poor people (Dowla 2006). The community development projects did raise (i) the confidence levels and feeling of well-being of the vast majority of the participants, (ii) improve the employability and (iii) employment opportunity of the participants.

These should help to create social norms, rules and regulations, cooperation and social networks. Thus, it also helps to grow a social culture in the community as well as in the economy.

## **5 Conclusion**

Social capital is a broad term containing the social norms and networks that generate shared understandings, trust and reciprocity, which underpin co-operation and collective action for mutual benefits, and creates the base for economic prosperity. Social capital could be accumulated when people interact in a purposeful manner with each other in families, workplaces, neighbourhoods, (local, national or international) associations and range of informal and formal meeting places. These social activities rise as human capital develops through schooling. Educated individuals are interested in dialogue and conversation. Interaction enables people to build communities, to commit themselves to each other, and thereby to knit the social fabric. Thus social capital greases the wheels that allow communities or nations to advance smoothly.

This paper tries to develop mechanism through which social capital forms and contributes to economic growth in endogenous growth model framework. This study deals with the building of social capital through human capital formation that is created from productive consumption. The economic growth rate is more compared to traditional growth rate. The predictions of the model are examined empirically for a cross-section of countries and have substantial support in the chosen sample data.

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Figure 1: Social Capital Formation with Multiple Equilibrium

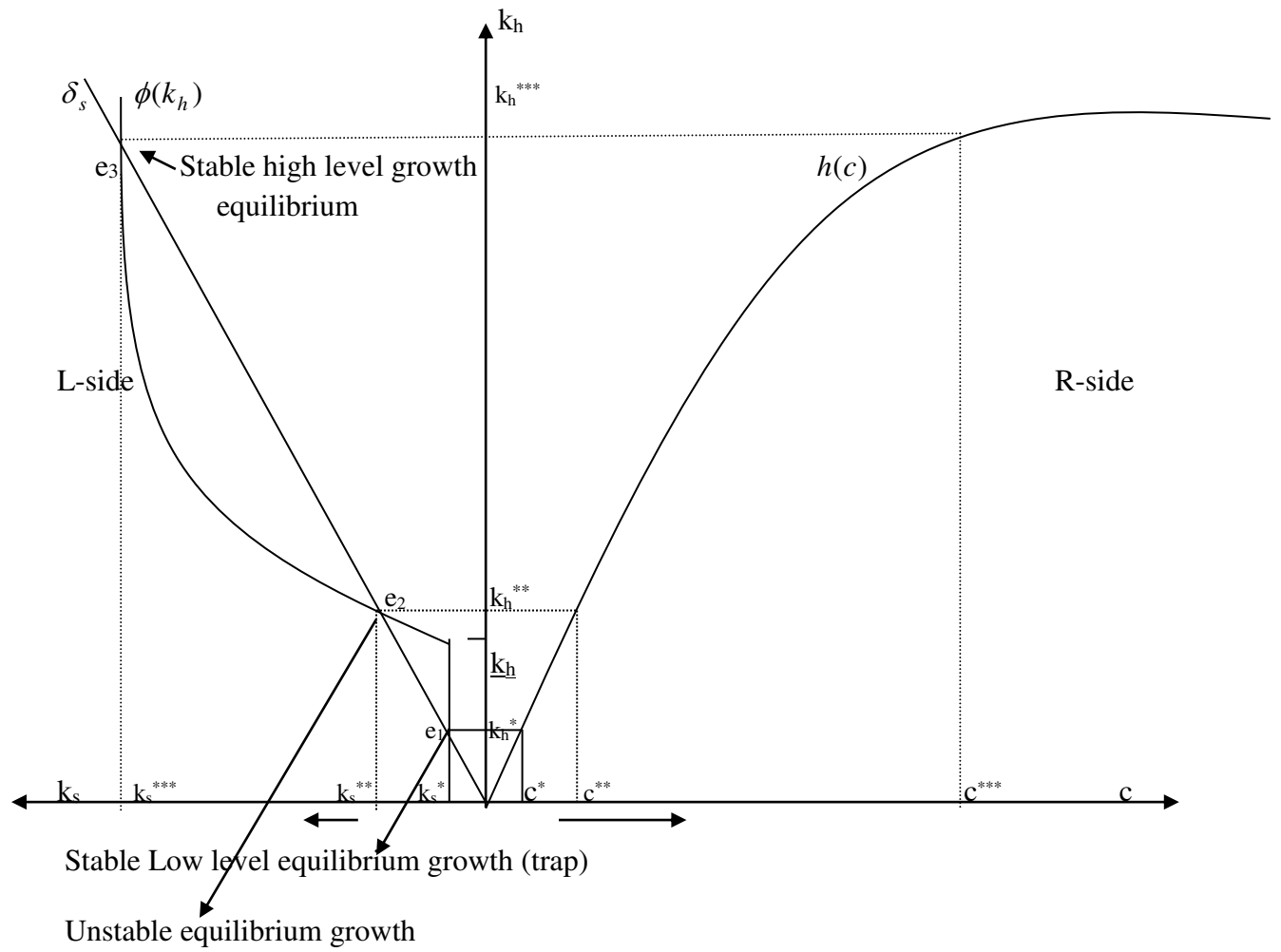


Table 1: Results of the impacts of schooling on socioeconomic and political variables

Variable	Dependent Variables						
	Civil Right	Political Right	Life Expectancy	Social Infrastructure	Trust	GDP	log(GDP)
Constant	3.060	3.065	56.191	0.151	7.569	-5663.6	6.947
t-value	(4.89)	(6.41)	(35.14)	(2.3)	(1.63)	(-3.43)	(35.78)
Mean <b>Schooling</b> (year)	<b>0.348</b>	<b>0.345</b>	<b>2.073</b>	<b>0.064</b>	<b>3.597</b>	<b>2422.8</b>	<b>0.291</b>
t-value	<b>(3.9)</b>	<b>(5.06)</b>	<b>(9.1)</b>	<b>(6.9)</b>	<b>(5.43)</b>	<b>(10.3)</b>	<b>(10.54)</b>
$R^2$	0.2142	0.314	0.5966	0.4592	0.345	0.6547	0.6648
$\bar{R}^2$	0.2002	0.3017	0.5894	0.4495	0.3333	0.6485	0.6589
Loglikelihood function	-114.59	-99.005	-169.04	16.2259	-230.96	-571.54	-46.759
No. of Countries	58	58	58	58	58	58	58

Table 2: Results of Social Capital on the Income level (GDP)

Variables	Income level (GDP)			
	(1)	(2)	(3)	(4)
Intercept	366.04 (0.2)	-9865.9*** (-6.28)	-10766*** (-8.42)	-19761*** (-3.92)
<b>Trust</b>	314.57*** (6.29)	68.955* (1.902)		22.747 (0.75)
<b>Social Infrastructure</b>		19312*** (6.02)	16362*** (6.71)	14398*** (5.24)
Civil Right		1913.5*** (2.77)	857.93** (2.57)	1610.3*** (2.84)
Political Right		-625.57 (-1.24)		-712.63 (-1.67)
Schooling			1073.1*** (5.79)	775.18*** (3.35)
Life Expectancy				160.07* (1.76)
$R^2$	0.414	0.8387	0.8892	0.8998
$\bar{R}^2$	0.4036	0.8265	0.883	0.8880
Log likelihood function	-586.876	-549.464	-538.577	-535.661
No. of Observations	58	58	58	58

Note: The figures in parentheses are t-values. ‘\*\*\*’, ‘\*\*’ and ‘\*’ indicate the level of significance at 1%, 5% and 10%, respectively.

Table 3: Results of Social Capital on the Economic Growth rate.

Variables	Growth rate per capita					
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.6549 (1.3)	1.268** (2.19)	1.162 (1.41)	0.762 (0.94)	-2.743 (-0.75)	0.096 (0.03)
<b>Trust</b>	<b>0.038***</b> <b>(2.65)</b>	<b>0.062***</b> <b>(3.36)</b>	<b>0.044***</b> <b>(2.67)</b>	<b>0.069***</b> <b>(3.67)</b>	<b>0.073***</b> <b>(3.77)</b>	<b>0.069***</b> <b>(3.46)</b>
Social infrastructure		-2.35* (-1.98)		-3.764** (-2.26)	-2.197 (-1.01)	-3.831** (-2.12)
Civil right			-0.428 (-1.25)	-0.124 (-0.35)	0.095 (0.24)	-0.111 (-0.3)
Political right			0.296 (-1.1)	0.328 (1.26)	0.207 (0.73)	0.31 (1.1)
GDP					-0.0001 (-1.33)	
Mean schooling						-0.022 (-0.15)
Life expectation					0.044 (0.95)	0.013 (0.2)
$R^2$	0.1113	0.1705	0.1361	0.2122	0.2389	0.2129
$\bar{R}^2$	0.0954	0.1404	0.0881	0.1528	0.1494	0.1203
Log likelihood function	-114.15	-112.15	-113.33	-110.66	-109.65	-110.63
No. of Observations	58	58	58	58	58	58

Note: The figures in parentheses are t-values. ‘\*\*\*’, ‘\*\*’ and ‘\*’ indicate the level of significance at 1%, 5% and 10%, respectively.

## Appendix

Table A1: List of countries in our sample study

Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Bolivia, Brazil, Canada, Chile, China, Colombia, Costa Rica, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Finland, France, Germany, Ghana, Great Britain, Greece, Guatemala, Honduras, Hungary, Iceland, India, Indonesia, Ireland, Italy, Japan, Jordan, Mexico, Netherlands, New Zealand, Nicaragua, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Romania, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, Uganda, Uruguay, USA, Venezuela, Zimbabwe.
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Table A2: Summary Statistics of the Variables

NAME	N	MEAN	ST. DEV	VARIANCE	MINIMUM	MAXIMUM
GDP	58	10118.	7907.4	6.2527E+9	686.25	26458.
GRWPC	58	1.8397	1.8531	3.4340	-2.3876	7.6887
TRUST	58	31.002	16.174	261.61	5.0000	66.100
MSCHOOL	58	6.5138	2.6407	6.9735	2.1900	12.000
LIFEPT	58	69.693	7.0867	50.222	46.753	78.837
SOCINF	58	0.57052	0.25091	0.062956	0.15633	1.0000
SCHLGD	58	58.725	28.319	801.98	15.345	120.52
POLRT	58	5.3276	1.9858	3.9434	1.0000	7.0000
CIVILRT	58	5.3103	1.6245	2.6388	1.0000	7.0000

Table A3: Correlation Matrix

TRUST	1.00								
GDP	<b>0.64</b>	1.00							
GRWPC	0.33	0.02	1.000						
MSCHOOL	<b>0.59</b>	0.81	0.107	1.00					
LIFEPT	0.51	0.79	0.106	0.77	1.00				
SOCINF	<b>0.64</b>	0.89	0.029	<b>0.68</b>	0.71	1.00			
SCHLGD	0.62	0.87	0.091	0.99	0.80	0.74	1.00		
POLRT	0.29	0.64	0.093	0.46	0.62	0.66	0.52	1.00	
CIVILRT	0.39	0.76	0.060	0.56	0.63	0.75	0.63	0.90	1.00
	TRUST	GDP	GRWPC	MSCHOOL	LIFEPT	SOCINF	SCHLGD	POLRT	CIVILRT